

Abstract

Introduction: CT remains the most prevalent sexually transmitted infection in developed and developing countries. Prenatal screening and treatment of pregnant women has resulted in a dramatic decrease of perinatal CT infection (conjunctivitis, pneumonia) in the US. Before the implementation of screening, ~50% of infants born to mothers with CT infection developed chlamydial conjunctivitis and/or pneumonia. However, there have been no studies of the incidence of perinatal CT infection, including seroepidemiologic studies, following the implementation of screening and treatment as recommended by the CDC in 1993.

Methods: Anonymized banked serum and prospectively collected samples from children in Brooklyn, NY, were tested for CT IgG using the MIF assay. Serum samples were divided into 2 groups: 1: collected from 1991-1995, 2: from 2001-2013. Pts with *C. pneumoniae* (CP) infection (culture and/or antibody) were excluded.

Results: 491 serum samples were identified (age range 0-20). 71 samples were excluded due to evidence of CP infection. 34% of subjects <10 y in group 1 (pre-universal screening) had IgG against CT, while there were no positives in group 2 (post-universal screening), $p < 0.0001$. Children >10 y had a prevalence of 32% in group 1 and 3.48% in group 2, $p < 0.0001$.

Conclusion: Children <10 yr in group 1 (pre-screening) had relatively high rates of seropositivity, which were likely due to perinatal infection. This antibody was not due to CP, as sera from children with CP infection were excluded. The significantly lower rates in group 2 (post-screening) confirm that prenatal screening and treatment of pregnant women has been effective for prevention of CT infection in infants. The persistence of antibody after perinatal infection may have implications for use CT vaccine in populations/countries where prenatal screening and treatment is not done.

Introduction

- *C. trachomatis* (CT) is the most frequently reported notifiable disease in the U.S. Since 1994 CT has been the most frequent STD reported to the CDC (1).
- The prevalence of CT among sexually active females, 14-19 yo (1999-2008) has been estimated to be 6.8%. The 2011 NY profile estimated a 9% prevalence (1).
- CT infection is frequently asymptomatic in adults and of long duration.
- There are no current epidemiologic studies of CT infection in children since the implementation of universal screening and treatment of pregnant women in the US, as recommended by the CDC in 1993 (2,4).

Aim

- To estimate trends of perinatal CT infection before and after the implementation of universal screening and treatment during pregnancy as recommended by the CDC in 1993.
- To estimate the current seroepidemiology of CT infection in children.

Methods

- Retrospective and prospective study
- Anonymized serum samples were obtained from children in 2 hospitals in Brooklyn, NY from 2012-2015
- Serum samples were divided into 2 groups:
 - Group 1: collected from 1991-1995
 - Group 2 : collected from 2001-2013
- Anti-CT IgG was determined by enzyme immunoassay (EIA) (Ani Labsystems).
- IgG $\geq 1:16$ was considered positive.
- Samples from patients with laboratory diagnosed *C. pneumoniae* infection (culture and/or serology) were excluded.
- Infants less than 1 year of age were excluded from the analysis as their antibody titers reflect placental transmission of maternal IgG.
- The following age strata were used: <10 and 10-20 years of age.
- Statistical analysis by Fisher's exact test.

Results

- A total of 510 serum samples were identified and/or collected.
- 79 samples were excluded due to evidence of *C. pneumoniae* infection, leaving 430 for analysis.
- 122 samples from cohort 1, 308 samples in cohort 2.
- Age range: 1 to 20 years
- The age-specific prevalence of IgG antibodies for both groups are shown in Table 1, $p < 0.0001$ (* and $^{\circ}$).

Table 1. Age-specific prevalence of anti-*C. trachomatis* IgG

	Age <10 y	Age 10-20y	Total
Group 1: 1991-1995 (n= 122)	34% (21/62) *	32% (19/60)	32.5% $^{\circ}$
Group 2: 2001-2011 (n= 308)	0% (0/110) *	3.5% (7/198)	3.48% $^{\circ}$

N/T = none tested

Discussion

- Relatively high rates of seropositivity in children < 10 y in cohort 1 (1991-1995) are likely due to perinatal infection. r
- The decrease of seropositivity in <10 y in group 2 ($p=0.0001$) may be secondary to implementation of universal screening and treatment of pregnant women, which resulted in decreased perinatal infection.
- Anti-CT IgG was only detected in adolescents >10 y in cohort 2 (2001-2012) suggesting acquisition via sexual transmission.

Conclusions

- The post-universal screening group (cohort 2) had lower prevalence of seropositivity. This may reflect the effect of universal screening and treatment of pregnant women.
- Thus, screening and treatment of pregnant women is the most effective way to prevent perinatal CT infection.
- Larger epidemiologic studies are needed to confirm current CT prevalence rates in children, especially in children younger than 14 years of age.
- These data may have implications for determining the age range for future CT vaccine trials.

References

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Figure 1. Age-specific prevalence of anti- *C. trachomatis* IgG

